ABSTRACT

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Title of diploma thesis: Significance of frequency of measurement on describing linear mechanical systems – *in vivo* measurements

This diploma thesis in its theoretical part deals with description of skin and its functions and properties. The main subject of interest are the mechanical properties of the skin. Second component of the theoretical part is a chapter about rheology and its importance for characterisation of mechanical properties especially biological materials.

The practical part is focused on *in vivo* measurement of mechanical parameters of human skin and on finding dependence of Hooke's and Newton's coefficients on frequency of the measurements. Hooke's coefficient represents the elastic part of the skin. Newton's coefficient characterises its viscosity. The method used was based on measuring impulse response with the dynamic viscoelastometer. Measurements took place on ten female volunteers. During the experiment we were changing the mass of the measuring probe with weights, thereby altering the frequency of measurement. By this proceeding we were able to discover the dependence of both coefficients on the measuring frequency.

From the experiment's results we discovered, that with decreasing frequency both coefficients are rising. We also find exponential dependence of Hooke's coefficient and linear dependence of Newton's coefficient on measuring frequency.